

## Claims

1. A carbon fiber paper comprising carbon fibers having a surface area ratio of 1.05 or more.
- 5 2. A carbon fiber paper according to Claim 1, wherein the carbon fibers have an average diameter of less than 5  $\mu\text{m}$ .
3. A carbon fiber paper according to Claims 1 or 2, wherein the carbon fibers have an average diameter of more than 3  $\mu\text{m}$ .
- 10 4. A carbon fiber paper according to any of Claims 1 to 3, wherein the carbon fibers have an average fiber length of at least 2 mm and at most 18 mm.
- 15 5. A carbon fiber paper according to Claim 4, wherein the carbon fibers have an average fiber length of at least 3 mm and at most 6 mm.
- 20 6. A carbon fiber paper according to any of Claims 1 to 5, which is obtained by wet papermaking.
- 25 7. A carbon fiber paper according to Claim 6, wherein a ratio of the MD strength which is a tensile strength in the papermaking direction of the carbon fiber paper and the CMD strength which is a tensile strength in the width direction which forms a 90 degree angle with the papermaking direction, is at least 1.0 and at most 2.5 in terms of MD strength/CMD strength.

8. A porous carbon electrode substrate for a fuel cell,  
comprising a carbon fiber paper according to any of Claims 1 to 7.

5 9. A porous carbon electrode substrate for a fuel cell  
according to Claim 8, wherein said porous carbon electrode substrate  
has a structure in which at least two carbon fiber papers each containing  
a carbonized resin are laminated, and  
at least one of the carbon fiber papers is the carbon fiber paper  
10 comprising carbon fibers having a surface area ratio of 1.05 or more.

10. A porous carbon electrode substrate for a fuel cell  
according to Claim 9, wherein said porous carbon electrode substrate  
has a structure in which the plurality of carbon fiber papers each  
15 containing a carbonized resin are the same kind and are laminated in  
such a state that the same sides of the papers are each directed outward.

11. A porous carbon electrode substrate for a fuel cell  
according to Claim 9, which comprises, as the carbon fiber paper  
20 containing a carbonized resin, besides a first carbon fiber paper which is  
the carbon fiber paper comprising carbon fibers having a surface area  
ratio of 1.05 or more, at least one second carbon fiber paper which is a  
carbon fiber paper comprising carbon fibers having an average diameter  
of at least 6  $\mu\text{m}$  and at most 20  $\mu\text{m}$  and an average fiber length of at least  
25 2 mm and at most 18 mm.

12. A porous carbon electrode substrate for a fuel cell

according to any of Claims 9 to 11, wherein the carbon fiber paper comprising carbon fibers having a surface area ratio of 1.05 or more is arranged as at least one outermost layer of the electrode substrate and the outer side of said outermost layer carbon fiber paper has a surface roughness of 5  $\mu\text{m}$  or less.

13. A porous carbon electrode substrate for a fuel cell according to Claim 8 or 9, wherein said electrode substrate has a thickness of at least 0.05 mm and at most 0.5 mm and a bulk density of at least 0.3  $\text{g}/\text{cm}^3$  and at most 0.8  $\text{g}/\text{cm}^3$ , and has a bending strength of 50 MPa or more and a deflection of 1.5 mm or more at the time of bending measured by a three-point bending test under the conditions of a strain speed of 10 mm/min, a distance between the supporting points of 2 cm and a test specimen width of 1 cm.

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14. A porous carbon electrode substrate for a fuel cell according to any of Claims 8 to 10, which has a tensile strength of 25 MPa or more.

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15. A porous carbon electrode substrate for a fuel cell according to any of Claims 8 to 11, which is windable around a roll of 40 cm or less in outer diameter and has a length of 1 m or more.

16. A porous carbon electrode substrate for a fuel cell according to any of Claims 8 to 12, which contains a carbonized resin in an amount of at least 10% by mass and at most 50% by mass.

17. A porous carbon electrode substrate for a fuel cell according to any of Claims 8 to 12, wherein a ratio of the MD surface resistance which is a surface resistance in the papermaking direction of the carbon fiber paper and the CMD surface resistance which is a surface resistance in the width direction which forms a 90 degree angle with the papermaking direction, is at least 1.0 and at most 2.5 in terms of MD surface resistance/CMD surface resistance.